Year	*Work Description*	*Associate*	*Manpower Baseline Support (ppy)*	*Manpower Priority Support (ppy)*	*Hardware, Cons., Other Expenditure Priority Support (kEuros)*
2010	**WP10-MHD-03-03-xx-01/MEdC** Theoretical modelling of error fields penetration and neoclassical toroidal viscosity non-resonant magnetic braking effects in tokamak plasmas Construct an 2-dimensional axisymmetric theoretical model capable to illustrate the mechanism of toroidal momentum dissipation and NTV global braking due to the non-resonant error fields destabilizing effect. The following steps to achieve are proposed: (i) Determination of a general multimode RWM dispersion relation for 2-D axisymmetric geometry in the presence of neoclassical viscosity and non-resonant error fields, (ii) Derivation of the evolution equations for the plasma angular motion at the level of the plasma boundary and inner non-ideal MHD layers (that develop at the corresponding inner rational surfaces) to prove global plasma deceleration and NTV braking of the plasma rotation, (iii) Electromagnetic and NTV torques calculation for shapes of the flux surfaces structure that include toroidicity, ellipticity, triangularity. The influence of the above parameters in finding the optimal less destabilizing error field spectrum will be calculated	MEdC	0.50	0.00	0.00

	WP10-MHD-03-03-xx-02/MEdC Rotational stabilization of the RWM by coupling to a dissipative rational surface. Evaluation of flow stabilization effects on ITER equilibrium states. Develop a new analytical model with a resonant layer inside of the plasma for Rotational stabilization of the RWM by coupling to a dissipative rational surface. This resonant layer can be a tearing or an internal kink mode, making use of the layer theory by Porcelli. Perform evaluation of flow stabilization effects on ITER equilibrium states and extension of the generic linear static equilibrium solutions applied to realistic ASDEX Upgrade equilibria and to an ITER equilibria with sheared flow parallel to the magnetic field with Alfvén Mach numbers on the order of 0.01. The potential stabilizing effect of the flow will be investigated by applying a sufficient condition for linear stability of equilibria with parallel flow.	MEdC	0.70	0.00	0.00